SEQUENCE LISTING

<110> Green, Allan
Singh, Surinder
Liu, Qing

<120> METHOD OF MODIFYING THE CONTENT OF COTTON SEED OIL

<130> p:\oper\mro\specifications\cottonseed oil US

<140> US
<141> 2001-04-18

<150> US 60/198,124
<151> 2000-04-18

<160> 35

<170> PatentIn version 3.0

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aag ctc cct tgc ttt gct ctt cca cca aag gcc acc ctt aga tct ccc      99
Lys Leu Pro Cys Phe Ala Leu Pro Pro Lys Ala Thr Leu Arg Ser Pro
    15                  20                  25

aag ttt tcc atg atc tcc acc att cct tct ggc tcc aaa gag gtt ggg     147
Lys Phe Ser Met Ile Ser Thr Ile Pro Ser Gly Ser Lys Glu Val Gly
30                  35                  40                  45

aat ctg aaa aag cct ttc acg cct cca aag gag gtg cct gtt cag atc     195
Asn Leu Lys Lys Pro Phe Thr Pro Pro Lys Glu Val Pro Val Gln Ile
                50                  55                  60

acc cac tcc atg ccg cct cac aag att gag atc ttt aaa tct ttg gag     243
Thr His Ser Met Pro Pro His Lys Ile Glu Ile Phe Lys Ser Leu Glu
            65                  70                  75

ggc tgg gct gag aac aac att ctg act cac ctc aaa cca gtt gag aaa     291
Gly Trp Ala Glu Asn Asn Ile Leu Thr His Leu Lys Pro Val Glu Lys
        80                  85                  90

tgt tgg caa ccc gcc gac ttt ctt cca gat cct aat tct gat gga ttt     339
Cys Trp Gln Pro Ala Asp Phe Leu Pro Asp Pro Asn Ser Asp Gly Phe
    95                  100                 105

cat gag caa gtc aaa gag ctt agg gaa agg gca aag gag atc cca gat     387
His Glu Gln Val Lys Glu Leu Arg Glu Arg Ala Lys Glu Ile Pro Asp
110                 115                 120                 125
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gat tac ttt gta gtt ttg gtt ggt gat atg atc acc gag gaa gcc ctt      435
Asp Tyr Phe Val Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu
                130                 135                 140

tca act tat caa aca atg ctt aat acc ttg gat gga act cgt gat gag      483
Ser Thr Tyr Gln Thr Met Leu Asn Thr Leu Asp Gly Thr Arg Asp Glu
            145                 150                 155

aca ggt gct agc ctt acc cct tgg gcc att tgg acc agg gct tgg act      531
Thr Gly Ala Ser Leu Thr Pro Trp Ala Ile Trp Thr Arg Ala Trp Thr
        160                 165                 170

gct gaa gaa aac agg cat ggt gat ctg ctt aat aag tat ctc tac ttg      579
Ala Glu Glu Asn Arg His Gly Asp Leu Leu Asn Lys Tyr Leu Tyr Leu
    175                 180                 185

tct ggg aga gtg gac atg agg caa att gag agg aca atc cag tac ttg      627
Ser Gly Arg Val Asp Met Arg Gln Ile Glu Arg Thr Ile Gln Tyr Leu
190                 195                 200                 205

att gga tcg gga atg gat cct cat aca gag aat agt cct tac cga gga      675
Ile Gly Ser Gly Met Asp Pro His Thr Glu Asn Ser Pro Tyr Arg Gly
                210                 215                 220

ttc ata tat act tcg ttc caa gaa agg gca act ttt att tcc cat ggg      723
Phe Ile Tyr Thr Ser Phe Gln Glu Arg Ala Thr Phe Ile Ser His Gly
            225                 230                 235

aat aca ggc agg ctg gct aag gag tat ggg gat att aac ttg gct caa      771
Asn Thr Gly Arg Leu Ala Lys Glu Tyr Gly Asp Ile Asn Leu Ala Gln
        240                 245                 250

att tgt ggt agc att gcc tca gat gag aag cgc cac gag aca gcc tat      819
Ile Cys Gly Ser Ile Ala Ser Asp Glu Lys Arg His Glu Thr Ala Tyr
    255                 260                 265

acc aaa atc gtt gaa aag ctg ttt gag att gat cct gat gaa aca gtc      867
Thr Lys Ile Val Glu Lys Leu Phe Glu Ile Asp Pro Asp Glu Thr Val
270                 275                 280                 285

ctg gca ttt gct gac atg atg aag aag aaa atc gcc atg ccg gct gag      915
Leu Ala Phe Ala Asp Met Met Lys Lys Lys Ile Ala Met Pro Ala Glu
                290                 295                 300

ttc atc tat gat ggc aga gat tat aac tta ttt gac cac tac tca gct      963
Phe Ile Tyr Asp Gly Arg Asp Tyr Asn Leu Phe Asp His Tyr Ser Ala
            305                 310                 315

gtt gcc caa aga atc ggg gtt tac act gct aag gac tat gtt gat ata     1011
Val Ala Gln Arg Ile Gly Val Tyr Thr Ala Lys Asp Tyr Val Asp Ile
        320                 325                 330

gta gag cac ctg gtg gat cga tgg aag gtg aag gag cta gct ggg ctt     1059
Val Glu His Leu Val Asp Arg Trp Lys Val Lys Glu Leu Ala Gly Leu
    335                 340                 345

tca gcc gag ggg cgt aaa gct cag gac tac ttg tgt tca ctt cct tcg     1107
Ser Ala Glu Gly Arg Lys Ala Gln Asp Tyr Leu Cys Ser Leu Pro Ser
350                 355                 360                 365

aga att aga agg tta gag gag aga gcg caa gaa aag gcc aag gaa gca     1155
Arg Ile Arg Arg Leu Glu Glu Arg Ala Gln Glu Lys Ala Lys Glu Ala
                370                 375                 380
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ccc agt gtc cca ttc agt tgg ata ttt gat aga gaa gtg aaa ctt          1200
Pro Ser Val Pro Phe Ser Trp Ile Phe Asp Arg Glu Val Lys Leu
            385                 390                 395

taggtcatga aatacagtta agactcctgc aatgcatttg aggaaacaaa cacgaagaag   1260

aattgcgtgg ctttggttag ggtagcacat gttttctgga tgtgttgtgt ccttaaaaaa   1320

taatgccgat agcggcagct gtgatagttt tagatgtttg ttttcataat gtctgttata   1380

tcgttgtacg agtagtatgt gttgtttttg ttgaaacaat gttcatatct tagtgataaa   1440

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Cys Phe Ala Leu Pro Pro Lys Ala Thr Leu Arg Ser Pro Lys Phe Ser
            20                  25                  30

Met Ile Ser Thr Ile Pro Ser Gly Ser Lys Glu Val Gly Asn Leu Lys
        35                  40                  45

Lys Pro Phe Thr Pro Pro Lys Glu Val Pro Val Gln Ile Thr His Ser
    50                  55                  60

Met Pro Pro His Lys Ile Glu Ile Phe Lys Ser Leu Glu Gly Trp Ala
65                  70                  75                  80

Glu Asn Asn Ile Leu Thr His Leu Lys Pro Val Glu Lys Cys Trp Gln
                85                  90                  95

Pro Ala Asp Phe Leu Pro Asp Pro Asn Ser Asp Gly Phe His Glu Gln
            100                 105                 110

Val Lys Glu Leu Arg Glu Arg Ala Lys Glu Ile Pro Asp Asp Tyr Phe
        115                 120                 125

Val Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Ser Thr Tyr
    130                 135                 140

Gln Thr Met Leu Asn Thr Leu Asp Gly Thr Arg Asp Glu Thr Gly Ala
145                 150                 155                 160
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Ser Leu Thr Pro Trp Ala Ile Trp Thr Arg Ala Trp Thr Ala Glu Glu
165 170 175

Asn Arg His Gly Asp Leu Leu Asn Lys Tyr Leu Tyr Leu Ser Gly Arg
180 185 190

Val Asp Met Arg Gln Ile Glu Arg Thr Ile Gln Tyr Leu Ile Gly Ser
195 200 205

Gly Met Asp Pro His Thr Glu Asn Ser Pro Tyr Arg Gly Phe Ile Tyr
210 215 220

Thr Ser Phe Gln Glu Arg Ala Thr Phe Ile Ser His Gly Asn Thr Gly
225 230 235 240

Arg Leu Ala Lys Glu Tyr Gly Asp Ile Asn Leu Ala Gln Ile Cys Gly
245 250 255

Ser Ile Ala Ser Asp Glu Lys Arg His Glu Thr Ala Tyr Thr Lys Ile
260 265 270

Val Glu Lys Leu Phe Glu Ile Asp Pro Asp Glu Thr Val Leu Ala Phe
275 280 285

Ala Asp Met Met Lys Lys Lys Ile Ala Met Pro Ala Glu Phe Ile Tyr
290 295 300

Asp Gly Arg Asp Tyr Asn Leu Phe Asp His Tyr Ser Ala Val Ala Gln
305 310 315 320

Arg Ile Gly Val Tyr Thr Ala Lys Asp Tyr Val Asp Ile Val Glu His
325 330 335

Leu Val Asp Arg Trp Lys Val Lys Glu Leu Ala Gly Leu Ser Ala Glu
340 345 350

Gly Arg Lys Ala Gln Asp Tyr Leu Cys Ser Leu Pro Ser Arg Ile Arg
355 360 365

Arg Leu Glu Glu Arg Ala Gln Glu Lys Ala Lys Glu Ala Pro Ser Val
370 375 380

Pro Phe Ser Trp Ile Phe Asp Arg Glu Val Lys Leu
385 390 395

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ttctttaaag ccagcaaa atg ggt gcc ggt ggt agg atg cca att gac ggt       111
                       Met Gly Ala Gly Gly Arg Met Pro Ile Asp Gly
                       1               5                   10

ata aag gag gaa aat cga ggc tcg gtc aat cga gtt ccg atc gag aag       159
Ile Lys Glu Glu Asn Arg Gly Ser Val Asn Arg Val Pro Ile Glu Lys
            15                  20                  25

cct ccg ttt acg ctc ggt cag atc aag caa gcc att ccg ccc cac tgt       207
Pro Pro Phe Thr Leu Gly Gln Ile Lys Gln Ala Ile Pro Pro His Cys
        30                  35                  40

ttt cgc cgc tcc ctc ctt cga tcc ttc tcc tac gtg gtc cat gac cta       255
Phe Arg Arg Ser Leu Leu Arg Ser Phe Ser Tyr Val Val His Asp Leu
    45                  50                  55

tgc tta gcc tct ttc ttt tac tac att gca aca tca tat ttt cac ttt       303
Cys Leu Ala Ser Phe Phe Tyr Tyr Ile Ala Thr Ser Tyr Phe His Phe
60                  65                  70                  75

ctc cca caa ccc ttt tcc tac att gct tgg cct gtc tat tgg gtt ctc       351
Leu Pro Gln Pro Phe Ser Tyr Ile Ala Trp Pro Val Tyr Trp Val Leu
                80                  85                  90

caa ggt tgc atc ctc acc ggt gtt tgg gtc atc gca cac gag tgg ggt       399
Gln Gly Cys Ile Leu Thr Gly Val Trp Val Ile Ala His Glu Trp Gly
            95                  100                 105

cac cac gct ttc aga gac tac caa tgg gtt gac gac acc gtc ggg ttg       447
His His Ala Phe Arg Asp Tyr Gln Trp Val Asp Asp Thr Val Gly Leu
        110                 115                 120

atc ctt cat tcc gcc ctt tta gtc ccg tac ttc tcg tgg aaa atc agt       495
Ile Leu His Ser Ala Leu Leu Val Pro Tyr Phe Ser Trp Lys Ile Ser
    125                 130                 135

cac cgc cgt cac cac tcg aac acc ggt tcc atg gag cgt gac gaa gta       543
His Arg Arg His His Ser Asn Thr Gly Ser Met Glu Arg Asp Glu Val
140                 145                 150                 155

ttc gtg ccc aaa ccc aag tct aaa tta tca tgc ttt gcg aaa tac tta       591
Phe Val Pro Lys Pro Lys Ser Lys Leu Ser Cys Phe Ala Lys Tyr Leu
                160                 165                 170

aac aat cca ccc ggt cga gtt cta tct ctt gta gtc aca ttg act ctt       639
Asn Asn Pro Pro Gly Arg Val Leu Ser Leu Val Val Thr Leu Thr Leu
            175                 180                 185

ggt tgg cct atg tac tta gcc ttc aac gtt tcg ggt cga tac tat gat       687
Gly Trp Pro Met Tyr Leu Ala Phe Asn Val Ser Gly Arg Tyr Tyr Asp
        190                 195                 200

cga tta gct tcc cac tat aac cct tat ggc ccc att tac tcc gat cgc       735
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Arg Leu Ala Ser His Tyr Asn Pro Tyr Gly Pro Ile Tyr Ser Asp Arg
    205                 210                 215

gag agg cta caa gtt tac atc tcc gat act ggt ata ttt gcg gta att      783
Glu Arg Leu Gln Val Tyr Ile Ser Asp Thr Gly Ile Phe Ala Val Ile
220                 225                 230                 235

tat gta ctt tat aag att gct gca aca aaa ggg ctg gct tgg ctt tta      831
Tyr Val Leu Tyr Lys Ile Ala Ala Thr Lys Gly Leu Ala Trp Leu Leu
                240                 245                 250

tgc act tat ggg gtg cct cta ctt att gtg aat gcc ttc ctt gtg ttg      879
Cys Thr Tyr Gly Val Pro Leu Leu Ile Val Asn Ala Phe Leu Val Leu
            255                 260                 265

atc acc tac ttg caa cat act cac tcg gca ttg ccg cat tat gac tcg      927
Ile Thr Tyr Leu Gln His Thr His Ser Ala Leu Pro His Tyr Asp Ser
        270                 275                 280

tcc gaa tgg gat tgg ttg cga gga gca ttg tcg acg atg gat cga gat      975
Ser Glu Trp Asp Trp Leu Arg Gly Ala Leu Ser Thr Met Asp Arg Asp
    285                 290                 295

ttc ggg gtg ttg aac aaa gtg ttc cat aac atc acc gat acg cat gtt     1023
Phe Gly Val Leu Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val
300                 305                 310                 315

gct cat cac ctc ttc tca acg atg cca cat tat cat gca atg gag gcc     1071
Ala His His Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala
                320                 325                 330

act aaa gca atc aaa cca ata ctc ggc aag tat tat cct ttc gac ggg     1119
Thr Lys Ala Ile Lys Pro Ile Leu Gly Lys Tyr Tyr Pro Phe Asp Gly
            335                 340                 345

aca ccg att tac aag gca atg tgg agg gag gca aaa gag tgc ctt tac     1167
Thr Pro Ile Tyr Lys Ala Met Trp Arg Glu Ala Lys Glu Cys Leu Tyr
        350                 355                 360

gtt gag cct gac gtt ggt ggt ggt ggt ggt ggt agc aaa ggt gtt ttt     1215
Val Glu Pro Asp Val Gly Gly Gly Gly Gly Gly Ser Lys Gly Val Phe
    365                 370                 375

tgg tat cgt aac aag ttc taaagaccga ccaactgcct gatagctggc            1263
Trp Tyr Arg Asn Lys Phe
380                 385

cggcgaaatc aacgtaaaac gtacttatta gactagtgtt aactagggaa gttaataatt   1323

aatggtagga aaatgtggaa tagttgccta gtagttttat gtattaagtg ttgtattaat   1383

aaactatatg gtagaaaaaa aaaaaaaa                                      1411
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1               5                   10                  15
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Arg Gly Ser Val Asn Arg Val Pro Ile Glu Lys Pro Pro Phe Thr Leu
            20                  25                  30

Gly Gln Ile Lys Gln Ala Ile Pro Pro His Cys Phe Arg Arg Ser Leu
        35                  40                  45

Leu Arg Ser Phe Ser Tyr Val Val His Asp Leu Cys Leu Ala Ser Phe
    50                  55                  60

Phe Tyr Tyr Ile Ala Thr Ser Tyr Phe His Phe Leu Pro Gln Pro Phe
65                  70                  75                  80

Ser Tyr Ile Ala Trp Pro Val Tyr Trp Val Leu Gln Gly Cys Ile Leu
                85                  90                  95

Thr Gly Val Trp Val Ile Ala His Glu Trp Gly His His Ala Phe Arg
            100                 105                 110

Asp Tyr Gln Trp Val Asp Asp Thr Val Gly Leu Ile Leu His Ser Ala
        115                 120                 125

Leu Leu Val Pro Tyr Phe Ser Trp Lys Ile Ser His Arg Arg His His
    130                 135                 140

Ser Asn Thr Gly Ser Met Glu Arg Asp Glu Val Phe Val Pro Lys Pro
145                 150                 155                 160

Lys Ser Lys Leu Ser Cys Phe Ala Lys Tyr Leu Asn Asn Pro Pro Gly
                165                 170                 175

Arg Val Leu Ser Leu Val Val Thr Leu Thr Leu Gly Trp Pro Met Tyr
            180                 185                 190

Leu Ala Phe Asn Val Ser Gly Arg Tyr Tyr Asp Arg Leu Ala Ser His
        195                 200                 205

Tyr Asn Pro Tyr Gly Pro Ile Tyr Ser Asp Arg Glu Arg Leu Gln Val
    210                 215                 220

Tyr Ile Ser Asp Thr Gly Ile Phe Ala Val Ile Tyr Val Leu Tyr Lys
225                 230                 235                 240

Ile Ala Ala Thr Lys Gly Leu Ala Trp Leu Leu Cys Thr Tyr Gly Val
                245                 250                 255

Pro Leu Leu Ile Val Asn Ala Phe Leu Val Leu Ile Thr Tyr Leu Gln
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260 265 270

His Thr His Ser Ala Leu Pro His Tyr Asp Ser Ser Glu Trp Asp Trp
275 280 285

Leu Arg Gly Ala Leu Ser Thr Met Asp Arg Asp Phe Gly Val Leu Asn
290 295 300

Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Leu Phe
305 310 315 320

Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala Ile Lys
325 330 335

Pro Ile Leu Gly Lys Tyr Tyr Pro Phe Asp Gly Thr Pro Ile Tyr Lys
340 345 350

Ala Met Trp Arg Glu Ala Lys Glu Cys Leu Tyr Val Glu Pro Asp Val
355 360 365

Gly Gly Gly Gly Gly Gly Ser Lys Gly Val Phe Trp Tyr Arg Asn Lys
370 375 380

Phe
385

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Met Gly Ala Gly Gly Arg
1 5

atg tcg gtt cca acg agt cca aaa aaa ccc gaa ttc aac tca ctg aag 163
Met Ser Val Pro Thr Ser Pro Lys Lys Pro Glu Phe Asn Ser Leu Lys
10 15 20

cga gtt cca tac tca aag cca ccc ttc act ctg agt gaa atc aag aaa 211
Arg Val Pro Tyr Ser Lys Pro Pro Phe Thr Leu Ser Glu Ile Lys Lys
25 30 35

gcc atc cca cca cac tgt ttc cag cgc tcc gtt tta cgc tca ttc tca 259
Ala Ile Pro Pro His Cys Phe Gln Arg Ser Val Leu Arg Ser Phe Ser
40 45 50

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tat ctc ctt tac gac ttt ata ttg gcc tct ctt ttt tac cat gtg gcc      307
Tyr Leu Leu Tyr Asp Phe Ile Leu Ala Ser Leu Phe Tyr His Val Ala
55                  60                  65                  70

acc aat tac ttc cct aac ctt cct cag gct ctc tcc aac gtg gct tgg      355
Thr Asn Tyr Phe Pro Asn Leu Pro Gln Ala Leu Ser Asn Val Ala Trp
                75                  80                  85

cct ctt tat tgg gcc atg caa ggt tgc att ttg acc ggc gtt tgg gtc      403
Pro Leu Tyr Trp Ala Met Gln Gly Cys Ile Leu Thr Gly Val Trp Val
            90                  95                  100

ata gcc cat gaa tgt ggc cac cat gct ttc agt gat tat caa tgg ctt      451
Ile Ala His Glu Cys Gly His His Ala Phe Ser Asp Tyr Gln Trp Leu
        105                 110                 115

gac gac acc gtg ggc ctt atc ctc cac tct tct ctc tta gtt cca tat      499
Asp Asp Thr Val Gly Leu Ile Leu His Ser Ser Leu Leu Val Pro Tyr
    120                 125                 130

ttc tct tgg aaa tat agc cac cgg cgt cac cat tct aac acc ggt tcc      547
Phe Ser Trp Lys Tyr Ser His Arg Arg His His Ser Asn Thr Gly Ser
135                 140                 145                 150

ctc gaa agg gat gaa gtg ttc gtt ccc aag aaa aaa tct ggt tta aga      595
Leu Glu Arg Asp Glu Val Phe Val Pro Lys Lys Lys Ser Gly Leu Arg
                155                 160                 165

tgg tgg gcc aaa cac ttc aac aat cca ccg ggt cgg ttt ctg tca atc      643
Trp Trp Ala Lys His Phe Asn Asn Pro Pro Gly Arg Phe Leu Ser Ile
            170                 175                 180

acc att caa ctt acc ctt ggt tgg ccg ctt tac tta gct ttc aac gtt      691
Thr Ile Gln Leu Thr Leu Gly Trp Pro Leu Tyr Leu Ala Phe Asn Val
        185                 190                 195

gcc ggc cgg cct tac gac agg ttc gct tgc cac tat gac cct tac ggc      739
Ala Gly Arg Pro Tyr Asp Arg Phe Ala Cys His Tyr Asp Pro Tyr Gly
    200                 205                 210

ccc ata ttt tcc gac cgg gaa cga ctc caa atc tat atc tct gac gcc      787
Pro Ile Phe Ser Asp Arg Glu Arg Leu Gln Ile Tyr Ile Ser Asp Ala
215                 220                 225                 230

ggc gtc ctc gct gtc gcc tat gcg ctc tac cgt ctc gtg ttg gcc aaa      835
Gly Val Leu Ala Val Ala Tyr Ala Leu Tyr Arg Leu Val Leu Ala Lys
                235                 240                 245

ggg gta ggt tgg gtt att agc gtt tat ggg gtg cca tta ttg gtg gtt      883
Gly Val Gly Trp Val Ile Ser Val Tyr Gly Val Pro Leu Leu Val Val
            250                 255                 260

aac gcc ttc tta gta atg atc acg tat ttg caa cac act cac cca tct      931
Asn Ala Phe Leu Val Met Ile Thr Tyr Leu Gln His Thr His Pro Ser
        265                 270                 275

ttg ccg cac tat gat tcc tcg gag tgg gac tgg atg aga gga gct tta      979
Leu Pro His Tyr Asp Ser Ser Glu Trp Asp Trp Met Arg Gly Ala Leu
    280                 285                 290

tca act gtg gac aga gat tat ggg att tta aac aag gtt ttc cat aac     1027
Ser Thr Val Asp Arg Asp Tyr Gly Ile Leu Asn Lys Val Phe His Asn
295                 300                 305                 310
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ata acc gac act cat gtg gct cat cat ttg ttt tcg aca atg cct cac      1075
Ile Thr Asp Thr His Val Ala His His Leu Phe Ser Thr Met Pro His
                    315                 320                 325

tat cat gcc atg gtg gcc acc aag gcg ata aag ccc ata ttg ggg gaa      1123
Tyr His Ala Met Val Ala Thr Lys Ala Ile Lys Pro Ile Leu Gly Glu
                330                 335                 340

tac tat cag ttc gat ggg atg cct gtc tat aag gcg ata tgg agg gag      1171
Tyr Tyr Gln Phe Asp Gly Met Pro Val Tyr Lys Ala Ile Trp Arg Glu
            345                 350                 355

gcg aag gag tgt ctc tac gtt gaa cca gat gag ggc gac aag gat aaa      1219
Ala Lys Glu Cys Leu Tyr Val Glu Pro Asp Glu Gly Asp Lys Asp Lys
        360                 365                 370

ggt gtg ttt tgg ttt aga aac aag ctt taaatatttg cattttacct            1266
Gly Val Phe Trp Phe Arg Asn Lys Leu
375                 380

taggcatgtt ctagtcgttg atgttttaag gatattttag ccgacatact tggttttcct   1326

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<212> PRT
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            20                  25                  30

Leu Ser Glu Ile Lys Lys Ala Ile Pro Pro His Cys Phe Gln Arg Ser
        35                  40                  45

Val Leu Arg Ser Phe Ser Tyr Leu Leu Tyr Asp Phe Ile Leu Ala Ser
    50                  55                  60

Leu Phe Tyr His Val Ala Thr Asn Tyr Phe Pro Asn Leu Pro Gln Ala
65                  70                  75                  80

Leu Ser Asn Val Ala Trp Pro Leu Tyr Trp Ala Met Gln Gly Cys Ile
                85                  90                  95

Leu Thr Gly Val Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
            100                 105                 110
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```
Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Leu His Ser
        115                 120                 125

Ser Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
    130                 135                 140

His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
145                 150                 155                 160

Lys Lys Ser Gly Leu Arg Trp Trp Ala Lys His Phe Asn Asn Pro Pro
                165                 170                 175

Gly Arg Phe Leu Ser Ile Thr Ile Gln Leu Thr Leu Gly Trp Pro Leu
            180                 185                 190

Tyr Leu Ala Phe Asn Val Ala Gly Arg Pro Tyr Asp Arg Phe Ala Cys
        195                 200                 205

His Tyr Asp Pro Tyr Gly Pro Ile Phe Ser Asp Arg Glu Arg Leu Gln
    210                 215                 220

Ile Tyr Ile Ser Asp Ala Gly Val Leu Ala Val Ala Tyr Ala Leu Tyr
225                 230                 235                 240

Arg Leu Val Leu Ala Lys Gly Val Gly Trp Val Ile Ser Val Tyr Gly
                245                 250                 255

Val Pro Leu Leu Val Val Asn Ala Phe Leu Val Met Ile Thr Tyr Leu
            260                 265                 270

Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp Asp
        275                 280                 285

Trp Met Arg Gly Ala Leu Ser Thr Val Asp Arg Asp Tyr Gly Ile Leu
    290                 295                 300

Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Leu
305                 310                 315                 320

Phe Ser Thr Met Pro His Tyr His Ala Met Val Ala Thr Lys Ala Ile
                325                 330                 335

Lys Pro Ile Leu Gly Glu Tyr Tyr Gln Phe Asp Gly Met Pro Val Tyr
            340                 345                 350

Lys Ala Ile Trp Arg Glu Ala Lys Glu Cys Leu Tyr Val Glu Pro Asp
        355                 360                 365
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Glu Gly Asp Lys Asp Lys Gly Val Phe Trp Phe Arg Asn Lys Leu
370 375 380

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aaaggcccaa ctaatccaaa caaaacttga gtgttacaat ctaaccctag tctggcaacg 180

gatacgggtt aagggtgtta caacctttac agtgatcaac gaacaaacct tgagtggatt 240

tggatttgac ccccctaccc cactacacac aaggaagaat gttagtttag ttattcaata 300

gctactaagt tggtttacat atatatacaa gttccacact tgattctcaa tcaatgtgag 360

actaatgctt ttcatttctc tcaacataat tcacaagtag cttactttga gtatcaattt 420

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His Glu Xaa Gly His His
1 5

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<400> 27
His Arg Arg His His
1 5

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<400> 28
His Val Ala His His
1 5

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<221> misc_feature
<222> ()..()
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<400> 29

His Xaa Xaa His His
1 5

<210> 30
<211> 6
<212> PRT
<213> synthetic peptide

<220>
<221> misc_feature
<222> ()..()
<223> Xaa at position 2 is any amino acid; Xaa at position 3 is any amino acid; Xaa at posiation 4 is any amino acid

<400> 30

His Xaa Xaa Xaa His His
1 5

<210> 31
<211> 383
<212> PRT
<213> Glycine maxFAD2-2

<400> 31

Met Gly Ala Gly Gly Arg Thr Asp Val Pro Pro Ala Asn Arg Lys Ser
1 5 10 15

Glu Val Asp Pro Leu Lys Arg Val Pro Phe Glu Lys Pro Gln Phe Ser
20 25 30

Leu Ser Gln Ile Lys Lys Ala Ile Pro Pro His Cys Phe Gln Arg Ser
35 40 45

Val Leu Arg Ser Phe Ser Tyr Val Val Tyr Asp Leu Thr Ile Ala Phe
50 55 60

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Cys Leu Tyr Tyr Val Ala Thr His Tyr Phe His Leu Leu Pro Gly Pro
65                  70                  75                  80

Leu Ser Phe Arg Gly Met Ala Ile Tyr Trp Ala Val Gln Gly Cys Ile
                85                  90                  95

Leu Thr Gly Val Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
            100                 105                 110

Ser Asp Tyr Gln Leu Leu Asp Asp Ile Val Gly Leu Ile Leu His Ser
        115                 120                 125

Ala Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
    130                 135                 140

His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
145                 150                 155                 160

Gln Lys Ser Cys Ile Lys Trp Tyr Ser Lys Tyr Leu Asn Asn Pro Pro
                165                 170                 175

Gly Arg Val Leu Thr Leu Ala Val Thr Leu Thr Leu Gly Trp Pro Leu
            180                 185                 190

Tyr Leu Ala Leu Asn Val Ser Gly Arg Pro Tyr Asp Arg Phe Ala Cys
        195                 200                 205

His Tyr Asp Pro Tyr Gly Pro Ile Tyr Ser Asp Arg Glu Arg Leu Gln
    210                 215                 220

Ile Tyr Ile Ser Asp Ala Gly Val Leu Ala Val Val Tyr Gly Leu Phe
225                 230                 235                 240

Arg Leu Ala Met Ala Lys Gly Leu Ala Trp Val Val Cys Val Tyr Gly
                245                 250                 255

Val Pro Leu Leu Val Val Asn Gly Phe Leu Val Leu Ile Thr Phe Leu
            260                 265                 270

Gln His Thr His Pro Ala Leu Pro His Tyr Thr Ser Ser Glu Trp Asp
        275                 280                 285

Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile Leu
    290                 295                 300

Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Leu
305                 310                 315                 320

Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala Thr Lys Ala Ile
                325                 330                 335

Lys Pro Ile Leu Gly Glu Tyr Tyr Arg Phe Asp Glu Thr Pro Phe Val
            340                 345                 350

Lys Ala Met Trp Arg Glu Ala Arg Glu Cys Ile Tyr Val Glu Pro Asp
        355                 360                 365

Gln Ser Thr Glu Ser Lys Gly Val Phe Trp Tyr Asn Asn Lys Leu
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<212> PRT
<213> Arabidopsis thaliana FAD2

<400> 32

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Glu Thr Asp Thr Thr Lys Arg Val Pro Cys Glu Lys Pro Pro Phe Ser
            20                  25                  30

Val Gly Asp Leu Lys Lys Ala Ile Pro Pro His Cys Phe Lys Arg Ser
        35                  40                  45

Ile Pro Arg Ser Phe Ser Tyr Leu Ile Ser Asp Ile Ile Ile Ala Ser
    50                  55                  60

Cys Phe Tyr Tyr Val Ala Thr Asn Tyr Phe Ser Leu Leu Pro Gln Pro
65                  70                  75                  80

Leu Ser Tyr Leu Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val
                85                  90                  95

Leu Thr Gly Ile Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
            100                 105                 110

Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Phe His Ser
        115                 120                 125

Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
    130                 135                 140

His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
145                 150                 155                 160

Gln Lys Ser Ala Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu
                165                 170                 175

Gly Arg Ile Met Met Leu Thr Val Gln Phe Val Leu Gly Trp Pro Leu
            180                 185                 190

Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp Gly Phe Ala Cys
        195                 200                 205

His Phe Phe Pro Asn Ala Pro Ile Tyr Asn Asp Arg Glu Arg Leu Gln
    210                 215                 220

Ile Tyr Leu Ser Asp Ala Gly Ile Leu Ala Val Cys Phe Gly Leu Tyr
225                 230                 235                 240

Arg Tyr Ala Ala Ala Gln Gly Met Ala Ser Met Ile Cys Leu Tyr Gly
                245                 250                 255

Val Pro Leu Leu Ile Val Asn Ala Phe Leu Val Leu Ile Thr Tyr Leu
            260                 265                 270

Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp Asp
        275                 280                 285

Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile Leu
    290                 295                 300

Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Leu
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305 310 315 320

Phe Ser Thr Met Pro His Tyr Asn Ala Met Glu Ala Thr Lys Ala Ile
325 330 335

Lys Pro Ile Leu Gly Asp Tyr Tyr Gln Phe Asp Gly Thr Pro Trp Tyr
340 345 350

Val Ala Met Tyr Arg Glu Ala Lys Glu Cys Ile Tyr Val Glu Pro Asp
355 360 365

Arg Glu Gly Asp Lys Lys Gly Val Tyr Trp Tyr Asn Asn Lys Leu
370 375 380

<210> 33
<211> 387
<212> PRT
<213> Glycine max FAD2-1

<400> 33

Met Gly Leu Ala Lys Glu Thr Thr Met Gly Gly Arg Gly Arg Val Ala
1 5 10 15

Lys Val Glu Val Gln Gly Lys Lys Pro Leu Ser Arg Val Pro Asn Thr
20 25 30

Lys Pro Pro Phe Thr Val Gly Gln Leu Lys Lys Ala Ile Pro Pro His
35 40 45

Cys Phe Gln Arg Ser Leu Leu Thr Ser Phe Ser Tyr Val Val Tyr Asp
50 55 60

Leu Ser Phe Ala Phe Ile Phe Tyr Ile Ala Thr Thr Tyr Phe His Leu
65 70 75 80

Leu Pro Gln Pro Phe Ser Leu Ile Ala Trp Pro Ile Tyr Trp Val Leu
85 90 95

Gln Gly Cys Leu Leu Thr Gly Val Trp Val Ile Ala His Glu Cys Gly
100 105 110

His His Ala Phe Ser Lys Tyr Gln Trp Val Asp Asp Val Val Gly Leu
115 120 125

Thr Leu His Ser Thr Leu Leu Val Pro Tyr Phe Ser Trp Lys Ile Ser
130 135 140

His Arg Arg His His Ser Asn Thr Gly Ser Leu Asp Arg Asp Glu Val
145 150 155 160

Phe Val Pro Lys Pro Lys Ser Lys Val Ala Trp Phe Ser Lys Tyr Leu
165 170 175

Asn Asn Pro Leu Gly Arg Ala Val Ser Leu Leu Val Thr Leu Thr Ile
180 185 190

Gly Trp Pro Met Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp
195 200 205

Ser Phe Ala Ser His Tyr His Pro Tyr Ala Pro Ile Tyr Ser Asn Arg
210 215 220

Glu Arg Leu Leu Ile Tyr Val Ser Asp Val Ala Leu Phe Ser Val Thr
225 230 235 240

Tyr Ser Leu Tyr Arg Val Ala Thr Leu Lys Gly Leu Val Trp Leu Leu
245 250 255

Cys Val Tyr Gly Val Pro Leu Leu Ile Val Asn Gly Phe Leu Val Thr
260 265 270

Ile Thr Tyr Leu Gln His Thr His Phe Ala Leu Pro His Tyr Asp Ser
275 280 285

Ser Glu Trp Asp Trp Leu Lys Gly Ala Leu Ala Thr Met Asp Arg Asp
290 295 300

Tyr Gly Ile Leu Asn Lys Val Phe His His Ile Thr Asp Thr His Val
305 310 315 320

Ala His His Leu Phe Ser Thr Met Pro His Tyr His Ala Met Glu Ala
325 330 335

Thr Asn Ala Ile Lys Pro Ile Leu Gly Glu Tyr Tyr Gln Phe Asp Asp
340 345 350

Thr Pro Phe Tyr Lys Ala Leu Trp Arg Glu Ala Arg Glu Cys Leu Tyr
355 360 365

Val Glu Pro Asp Glu Gly Thr Ser Glu Lys Gly Val Tyr Trp Tyr Arg
370 375 380

Asn Lys Tyr
385

<210> 34
<211> 377
<212> PRT
<213> Brassica napus FAD3

<400> 34

Met Val Val Ala Met Asp Gln Arg Ser Asn Ala Asn Gly Asp Glu Arg
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Phe Asp Pro Ser Ala Gln Pro Pro Phe Lys Ile Gly Asp Ile Arg Ala
20 25 30

Ala Ile Pro Lys His Cys Trp Val Lys Ser Pro Leu Arg Ser Met Ser
35 40 45

Tyr Val Ala Arg Asp Ile Phe Ala Val Val Ala Leu Ala Val Ala Ala
50 55 60

Val Tyr Phe Asp Ser Trp Phe Phe Trp Pro Leu Tyr Trp Ala Ala Gln
65 70 75 80

Gly Thr Leu Phe Trp Ala Ile Phe Val Leu Gly His Asp Cys Gly His
85 90 95

Gly Ser Phe Ser Asp Ile Pro Leu Leu Asn Thr Ala Val Gly His Ile
100 105 110

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Leu His Ser Phe Ile Leu Val Pro Tyr His Gly Trp Arg Ile Ser His
        115                 120                 125

Arg Thr His His Gln Asn His Gly His Val Glu Asn Asp Glu Ser Trp
    130                 135                 140

Val Pro Leu Pro Glu Lys Leu Tyr Lys Asn Leu Ser His Ser Thr Arg
145                 150                 155                 160

Met Leu Arg Tyr Thr Val Pro Leu Pro Met Leu Ala Tyr Pro Leu Tyr
                165                 170                 175

Leu Trp Tyr Arg Ser Pro Gly Lys Glu Gly Ser His Tyr Asn Pro Tyr
            180                 185                 190

Ser Ser Leu Phe Ala Pro Ser Glu Arg Lys Leu Ile Ala Thr Ser Thr
        195                 200                 205

Thr Cys Trp Ser Ile Met Leu Ala Thr Leu Val Tyr Leu Ser Phe Leu
    210                 215                 220

Val Gly Pro Val Thr Val Leu Lys Val Tyr Gly Val Pro Tyr Ile Ile
225                 230                 235                 240

Phe Val Met Trp Leu Asp Ala Val Thr Tyr Leu His His His Gly His
                245                 250                 255

Asp Asp Lys Leu Pro Trp Tyr Arg Gly Lys Glu Trp Ser Tyr Leu Arg
            260                 265                 270

Gly Gly Leu Thr Thr Ile Asp Arg Asp Tyr Gly Ile Phe Asn Asn Ile
        275                 280                 285

His His Asp Ile Gly Thr His Val Ile His His Leu Phe Pro Gln Ile
    290                 295                 300

Pro His Tyr His Leu Val Asp Ala Thr Lys Ser Ala Lys His Val Leu
305                 310                 315                 320

Gly Arg Tyr Tyr Arg Glu Pro Lys Thr Ser Gly Ala Ile Pro Ile His
                325                 330                 335

Leu Val Glu Ser Leu Val Ala Ser Ile Lys Lys Asp His Tyr Val Ser
            340                 345                 350

Asp Thr Gly Asp Ile Val Phe Tyr Glu Thr Asp Pro Asp Leu Tyr Val
        355                 360                 365

Tyr Ala Ser Asp Lys Ser Lys Ile Asn
    370                 375
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<210> 35
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<213> Glycinemax FAD6

<400> 35

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Met Ala Cys Thr Leu Ala Asp Ser Leu Leu Leu Phe Lys Gly Ser Tyr
1               5                   10                  15
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Gln Lys Pro Val Leu Arg Arg Asp Ile Ala Ala Arg Tyr Ser Pro Gly
            20                  25                  30

Ile Phe Ser Leu Asn Ser Asn Gly Leu Ile Gln Lys Arg Phe Arg Arg
        35                  40                  45

Gln Arg Asn Phe Val Thr Arg Asn Lys Val Thr Val Ile His Ala Val
    50                  55                  60

Ala Ile Pro Val Gln Pro Ala Pro Val Glu Ser Ala Glu Tyr Arg Lys
65                  70                  75                  80

Gln Leu Ala Glu Asp Tyr Gly Phe Arg Gln Val Gly Glu Pro Leu Ser
                85                  90                  95

Asp Asp Val Thr Leu Lys Asp Val Ile Asn Pro Leu Pro Lys Glu Val
            100                 105                 110

Phe Glu Ile Asp Asp Val Lys Ala Trp Lys Ser Val Leu Ile Ser Val
        115                 120                 125

Thr Ser Tyr Ala Leu Gly Leu Phe Met Ile Ser Lys Ala Pro Trp Tyr
    130                 135                 140

Leu Leu Pro Leu Ala Trp Val Trp Thr Gly Thr Ala Ile Thr Gly Phe
145                 150                 155                 160

Phe Val Ile Gly His Asp Cys Ala His Arg Ser Phe Ser Ser Asn Lys
                165                 170                 175

Leu Val Glu Asp Ile Val Gly Thr Leu Ala Phe Met Pro Leu Ile Tyr
            180                 185                 190

Pro Tyr Glu Pro Trp Arg Phe Lys His Asp Arg His His Ala Lys Thr
        195                 200                 205

Asn Met Leu Arg Glu Asp Thr Ala Trp His Pro Val Trp Lys Asp Glu
    210                 215                 220

Phe Glu Ser Thr Pro Leu Leu Arg Lys Ala Ile Ile Tyr Gly Tyr Gly
225                 230                 235                 240

Pro Phe Arg Cys Trp Met Ser Ile Ala His Trp Leu Met Trp His Phe
                245                 250                 255

Asp Leu Lys Lys Phe Arg Pro Ser Glu Val Pro Arg Val Lys Ile Ser
            260                 265                 270

Leu Ala Cys Val Phe Ala Phe Ile Ala Ile Gly Trp Pro Leu Ile Ile
        275                 280                 285

Tyr Lys Thr Gly Ile Met Gly Trp Ile Lys Phe Trp Leu Met Pro Trp
    290                 295                 300

Leu Gly Tyr His Phe Trp Met Ser Thr Phe Thr Met Val His His Thr
305                 310                 315                 320

Ala Pro Tyr Ile Pro Phe Lys Tyr Ser Glu Glu Trp Asn Arg Ala Gln
                325                 330                 335

Ala Gln Leu Asn Gly Thr Val His Cys Asp Tyr Pro Lys Trp Ile Glu
            340                 345                 350
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Ile Leu Cys His Asp Ile Asn Val His Ile Pro His His Ile Ser Pro
          355                 360                 365

Arg Ile Pro Ser Tyr Asn Leu Arg Ala Ala His Lys Ser Leu Gln Glu
     370                 375                 380

Asn Trp Gly Gln Tyr Leu Asn Glu Ala Ser Trp Asn Trp Arg Leu Met
385                 390                 395                 400

Lys Thr Ile Met Thr Val Cys Gln Val Tyr Asp Lys Glu Lys Ser Leu
                405                 410                 415

Cys Cys Leu Arg Arg Thr Cys Pro
            420
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